
USE OF MACROECONOMIC INDICATORS IN COMPARATIVE ANALYSES

Prof. Ion PÂRȚACHI PhD (*ipartachi@ase.md*)

Academy of Economic Studies of Moldova

Assoc. prof. Ana Maria POPESCU PhD (*notariat.dejure@gmail.com*)

Bucharest University of Economic Studies

Ștefan Gabriel DUMBRAVĂ PhD Student (*stefan.dumbrava@gmail.com*)

Bucharest University of Economic Studies

Abstract

This article has a theoretical character and the authors aimed to highlight the system of macroeconomic indicators, which is calculated in our country based on a methodology of the National Institute of Statistics similar to that of Eurostat, under the specific conditions of each period.

The article presents the methodology for calculating the indicators, their content and how to bring them in real terms in order to ensure international comparability.

In the case of Romania, which is not a member of the euro group, it often results in the fact that always the Gross Domestic Product calculated in lei, when it is transformed into currency, it shows more unconvincing evolutions. Of course, the process of deflation and the use of an exchange rate taken for a base period attenuate this comparability.

Macroeconomic indicators fully and structurally express the way in which the Romanian economy has evolved and is evolving from one period of time to another.

The article outlines in detail how to calculate some indicators, the statistical relationships used and the ability of these indicators to ensure international comparability. International comparability is important to know the place where Romania is located in different activities, being usually in the queue of the European Union rankings.

The article is significant and helpful for those who want to express opinions on the evolution of Romania compared to other states, because it is easy to move on to the practical part of using data that are contained in statistical yearbooks, in the communiqués of the National Institute of Statistics or calculated indicators advertise.

Keywords: macroeconomic indicators, international comparability, Gross Domestic Product, real terms, deflation.

JEL classification: E10, E20

Introduction

This article has as main objective the synthesis of the main theoretical aspects involved in the use of macroeconomic indicators in the analysis of international comparisons.

The article is based on a study of theory in this field, extracting the essential elements that underlie the calculation of macroeconomic indicators and then the need to deflate them to be brought in real terms, comparable internally and internationally and then the structure of these indicators, which can be used in certain circumstances and in factor analyses, which highlight the influence of the main factors that contribute to the results obtained by our country, which can then be compared with those recorded by other Member States in the European Union and why not, more broadly, European or even global.

The calculation of macroeconomic indicators in 2020 will highlight, without a doubt, a low level compared to 2019, as a result of the effect it had and has on the health and economic and financial crisis.

The computational relationships used are exposed and easy to use in the context where there is a concern of some researchers in this regard.

Literature review

The use of macroeconomic indicators in international comparisons is an important issue in economic and social analyses. This issue of comparability is a constant issue in the European Union, especially when building the budget and allocating it to the Member States. The content of these indicators is essential in the concern to establish hierarchies and to ascertain the level of development of each state in the European Community, but also in other international economic bodies. In this context, a number of economists-researchers have conducted substantial studies. Thus, Anghelache C. (2009) presented at the 57th International Conference Statistics-past, present and future communication on macroeconomic indicators used in international comparability, and Anghel M.G., Burea D., Dumbrava Ș.G. (2018) published a study on the use of Gross Domestic Product in comparative studies. Bardson G., Nymagen R., Jansen E. (2005) referred to the indicators used in international comparisons in their study of econometrics and macroeconomic modeling. Biji M., Biji E., Lilea E., Anghelache C. (2002) devote an entire chapter to this aspect in the extensive work Treatise on Statistics. Bils M., Yongsung Ch., Sun-Bin Chim (2009) publish a study on the comparative advantage of unemployment. Dinca L.G. (2011) refer to the indicators used in international comparisons in his paper Factorial regression models in the analysis of the links between indicators, and Yulle U.G., Kendal M.G. (1969) address these issues in Introduction to Statistical Theory.

Methodology, data, results and discussions

Regarding the international comparison of the degree of economic development of different countries, this can be done on the basis of indicators in physical expression by comparing the production and consumption per capita recorded for a number of commodities. The comparison involves making two lists: one with the countries being compared and another with the commodities being compared. It is necessary that these products be representative of all the countries covered by the comparison and somewhat similar in terms of quality.

In order to draw conclusions about the level of development, the method involves choosing a reference country, and the levels reached by the other countries are compared with the level of the country taken as a benchmark. For this purpose, the relative coordination quantities (Y) are used:

$$Y_i = \frac{X_i}{X_E} \cdot 100 \quad (1)$$

Where: X_i represents the level of the indicator in country i;

X_E represents the level of the indicator in the selected country as a standard (reference).

A comparison can also be made using the macroeconomic indicators of results calculated within the System of National Accounts. The international comparison of the level, structure and pace of development on the basis of macroeconomic performance indicators requires solving two key problems, namely: achieving comparability of indicators in terms of their content, scope and ensuring comparability of indicators in terms of the monetary units in which it is expressed.

Countries applying the System of National Accounts determine macroeconomic indicators according to a unitary conception and methodology. As for the exchange rate, it is the price to be paid in the foreign exchange market to obtain a currency unit. In the context of the international GDP comparison, theoretical and methodological debates have concluded that, for several reasons, the exchange rate cannot be considered a decisive factor in ensuring the comparability of indicators in absolute terms and cannot be used to transform synthetic indicators into national currency, because: it does not reflect the real structure of GDP; it is influenced by domestic and international factors, causing its fluctuations over short periods of time and there are multiple exchange rates.

In order to carry out a comparative analysis, three steps must in principle be followed. The first stage involves the Gross Domestic Product of

each country to be broken down into a number of primary expenditure groups. A second stage assumes that within each primary group there are prices for selected items, which should respect two essential properties: comparability (which means that the factors influencing the formation of the actual price are identical in the countries being compared) and representativeness (which means that the selected items are characteristic of the expenditure model and have a significant share in the primary group of countries participating in the comparison). The prices collected (recorded / observed) are used to obtain price ratios for individual goods and services, then the price ratios are calculated on average to obtain unweight parities at the primary group level; Finally, using as a weighting the GDP expenditure structures of the countries that are compared in the weighted geometric average formula, a PPC is obtained for each level of aggregation - up to the level of GDP. A third stage involves transforming the national values of the primary groups into internationally comparable values through purchasing power parity. The results obtained are real values, in order to distinguish them from the nominal values (expressed in national currency).

At the aggregate level, price indices are determined by one of the two usual weighting variants, by adjustment:

$$IP_P = \frac{\sum p_1 \cdot q_1}{\sum p_0 \cdot q_1} \quad \text{Paasche type price index} \quad (2)$$

$$IP_L = \frac{\sum p_1 \cdot q_0}{\sum p_0 \cdot q_0} \quad \text{Laspeyres price index} \quad (3)$$

The adjustment assumes that the prices of the products of the two countries are weighted, either with the quantities of one country (for example, country A) or with the quantities of the other country (or the reference country, country B). Corresponding to the two types of indices, the calculation relations will be:

$$IP_P^{A/B} = \frac{\sum p_A \cdot q_A}{\sum p_B \cdot q_A} \quad \text{and} \quad IP_L^{A/B} = \frac{\sum p_A \cdot q_B}{\sum p_B \cdot q_B} \quad (4)$$

There are some differences between the results obtained by using the two price indices due to the application of different weights. In order to eliminate these influences, a Fischer price index is calculated as the geometric mean of the Paasche and Laspeyres indices.

$$IP_F = \sqrt{IP_P^{A/B} \cdot IP_L^{A/B}} = \sqrt{\frac{\sum p_A \cdot q_A}{\sum p_B \cdot q_A} \cdot \frac{\sum p_A \cdot q_B}{\sum p_B \cdot q_B}} \quad (5)$$

Within each primary group, prices are collected for selected items that respect the properties of comparability and representativeness. The prices collected are used to obtain price reports for individual goods and services. Then, the average price ratios are calculated to obtain unweight parities at the primary group level. Finally, using as a weight the countries' Gross Domestic Product (GDP) expenditure structures that are compared in the weighted geometric mean formula, a Purchasing Power Parity (PPP) is obtained for each level of aggregation up to GDP level. Nominal values are converted to real values via PPC.

The main statistical information obtained from the comparison calculations are: price ratios (PPC) used to determine volume ratios, not just single general purchasing power parity, but a set of PPCs for deflating different groups. / categories of goods and services; general and per capita volume indices, the volume figures can be used to create zone, regional totals and determine the share of each country in total (a ranking of countries can be established in relation to a specific country taken as a basis (100.0%), the comparative price level index and structural indicators, for example: dividing the volume index of population consumption by the volume index of GDP, the relative volume index between two countries is determined, which, in the analysis, can be interpreted as follows so that it can be estimated that, relative to GDP, the relative volume in households or the so-called real consumption rate is higher or lower in one country than in another.

The introduction of the single currency involves the determination of economic aggregates in euros. Comparison programs will continue, as not all European Union member states are also members of the Monetary Union, and comparisons are also needed between EU and non-EU countries, and the use of the euro does not automatically mean eliminating price differences between Member States member.

Comparing purchasing power standardization can be applied in comparing a country of the European Union and a country outside the group.

Standard purchasing power parity (PSPC) is a notion specific to the international comparison of Gross Domestic Product. Cash is defined as for each aggregate of expenditure the total of the European Union obtained from the conversion of the values expressed in national currency by means of parities is equal to the total of the European Union for that aggregate expressed in euro.

Cash is also a specific notion of the international comparison of Gross Domestic Product. As a rule, a country's national currency is chosen as cash to express actual spending and purchasing power parities. Cash can also be the average for a certain group of countries, a common procedure in the European Union until the introduction of the euro.

Conclusions

The article based on the study conducted by the authors concludes that there is a need for international comparisons to identify the level in which Romania is compared to other states.

Macroeconomic indicators, first of all the Gross Domestic Product, the Gross Domestic Product per capita, the purchasing power parity and many others, accurately describe the place where Romania is located compared to other European countries. International comparisons based on the use of statistical indicators also reveal the differences that separate Romania from the more economically developed countries, but in a factorial analysis it also reveals the reasons for which such results are permanently obtained.

Without resorting to data, referring only to the indicators used in these international comparisons, we can establish precisely that the use of prices, price indices and especially the possibility of deflation puts us in a position to have indicators expressed in real figures, which is sufficiently convincing in the comparisons that are made.

On the other hand, these data are most often necessary in order to rank at the level of the banking institution, economic-financial or bodies of the European Union and others, which constantly show the level, the evolution of the level of development of each country.

Last but not least, the macroeconomic performance indicators are calculated according to the same methodology as that of Eurostat and thus ensure a level of coverage equal to that of the other countries we have talked about.

References

1. Anghelache, C. (2009) *Indicatori macroeconomici utilizați în comparabilitatea internațională*, Conferința a 57-a "Statistica - trecut, prezent și viitor", ISBN 978-90-73592-29-2, Durban
2. Anghel, M.G., Burea, D., Dumbravă, Ș.G. (2018). *Utilizarea produsului intern brut în studii comparative*, Revista Română de Statistică - Supliment, vol.2018, nr.9, pag.101 – 114
3. Bardsen, G., Nymagen, R., Jansen, E. (2005). *The Econometrics of Macroeconomic Modelling*, Oxford University Press
4. Biji, M., Biji, E.M., Lilea, E., Anghelache, C. (2002). *Tratat de statistică*, Editura Econoinică, București
5. Bils, M., Yongsung Chang, Sun-Bin Kim (2009). *Comparative Advantage and Unemployment*, RCER Working Papers, University of Rochester - Center for Economic Research (RCER)
6. Dincă, L.G. (2011). *Modele de regresie factorială în analiza legăturilor dintre indicatori*, Simpozionul Internațional *Criza economico-financiară și urgența reformei*, Universitatea Artifex din București
7. Yulle, U.G., KendaU, M.G. (1969). *Introducere în teoria statistică*, Editura Științifică, București